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Indian Standard

**GLOSSARY OF TERMS RELATING TO OIL
BURNING APPLIANCES (PRESSURE AND
NON-PRESSURE TYPE)**

UDC 001'4 : 683'944 : 662'94

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**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

Indian Standard

GLOSSARY OF TERMS RELATING TO OIL BURNING APPLIANCES (PRESSURE AND NON-PRESSURE TYPE)

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Indian Standard

GLOSSARY OF TERMS RELATING TO OIL BURNING APPLIANCES (PRESSURE AND NON-PRESSURE TYPE)

0. FOREWORD

0.1 This Indian Standard was adopted by the Bureau of Indian Standards on 21 September 1987, after the draft finalized by the Oil Burning Appliances Sectional Committee had been approved by the Consumer Products and Medical Instruments Division Council.

0.2 This standard is intended to make available simplified definitions of terms used in production and trade of oil burning appliances, both pressure and non-pressure type, including wax candles. The definitions are given in a manner so that they are generally understood by a user of this standard.

0.3 In this standard the terms have been arranged alphabetically throughout.

1. SCOPE

1.1 This standard defines the terms relating to oil burning appliances, both pressure and non-pressure type, including wax candles. These appliances are generally used for cooking, heating and lighting.

2. TERMINOLOGY

A

2.1 Absolute Dynamic Viscosity (of Oil) — It is a measure of the resistance which the oil in motion offers to shear, as measured in terms of force exerted by a stationary flat plate of unit area on a similar parallel plate unit length away and moving in its own plane with a unit velocity, the space between the plates being filled with the fluid in question. The unit of absolute dynamic viscosity is poise, but one-hundredth of it, that is, centipoise is used as a practical unit.

2.2 Absolute Kinematic Viscosity (of Oil) — The absolute dynamic viscosity divided by the density of oil gives its absolute kinematic viscosity, whose unit is stoke and one-hundredth of it, that is, centistoke is used as practical unit.

2.3 Additive — A suitable substance, which when added in small quantities to an oil or wax imparts to it specific desired properties or improves its original properties.

2.4 Air Entrainment — The process of inducing air by a jet of fuel vapour or gas for combustion purpose in a burner.

2.5 Air-Fuel Ratio — The ratio of volume of air to the weight of oil involved in combustion in the burner.

2.6 Air-Pocket — The space in the pressure lantern from where air is sucked into the mixing tube by the jet of kerosene vapour.

2.7 Air-Vitiation — Contamination of combustion air, specially by combustion products with consequent reduction of its oxygen content under conditions; such as impaired ventilation.

2.8 Aliphatic Hydrocarbons — The type of hydrocarbons of open-chain structure present in the oil, the more important ones being members of paraffin and olefin series.

2.9 Ambient — A term meaning the surrounding conditions, such as ambient air, ambient temperature, etc.

2.10 Anemometer — An instrument usually of vane or cup type used to measure the speed of air-draught as required to test the resistance of flame to draught.

2.11 Aromatic Hydrocarbons (Aromatics) — The organic compounds containing closed ring of carbon atoms, derived from benzene whose presence in oil reduces its smoke point.

B

2.12 Bloom — The translucent white deposit formed due to burning of kerosene on the glass chimney of hurricane lantern which causes partial opacity to the glass.

2.13 Blow Lamp — A heating appliance burning pressurized petrol or kerosene which is used wherever sufficient localized heating of a surface is required for short periods without the bad effect of oxidation.

2.14 Blow-Off (of Flame) — Separation of a flame from the burner resulting in its extinction.

2.15 Boiling Range — See distillation range.

2.16 Breaking Stress — The load per unit area under which the wax candle will break from the centre when tested by the standard method.

2.17 Burner — A device for final conveyance of oil vapour or a mixture of air and oil vapour to produce a suitable flame which is maintained on/in it.

2.18 Burner-Evaporator — The part of the burner of the pressure stove or pressure lantern or blow lamp in which the oil gets preheated and evaporated before passing through the nipple.

2.19 Burning Oil — See kerosene.

2.20 Burning Quality — The nature of performance of oil generally in a wick fed appliance as recognizable from soot formation or from paraffinicity and volatility of the oil.

2.21 Burning Test — The specified test on oil to evaluate char value on its burning as per IS : 1448 [P : 5] 1970*.

2.22 Bursting Pressure — The minimum hydraulic pressure capable of distorting and bursting an oil burning appliance under specified conditions of test.

C

2.23 Calorific Value (Heat of Combustion) — The number of heat units liberated by complete combustion of unit weight of oil under specified conditions:

- a) *Gross Calorific Value* — The sum of the number of heat units liberated by complete combustion of unit weight of oil and heat released by condensation of water vapour produced from the combustion.
- b) *Net Calorific Value* — The gross calorific value minus the heat released by the condensation of water vapour produced from combustion.

2.24 Candela (cd) — The sixtieth part of luminous intensity normally emitted by one cm square area of integral radiator (black body) at the temperature of solidification of platinum (1 773.5°C).

2.25 Candle Power — The luminous intensity expressed in candelas. It is the product of lux and square of distance between flame and photo-electric cell.

2.26 Capillarity — The characteristic of oil influencing its flow up through a wick in a wick-fed appliance. It is measured by the height attained by oil up a standard capillary tube. It decreases with increase in temperature.

*Methods of test for petroleum and its products: [P : 5] Burning quality (*first revision*).

2.27 Carbon Residue — The residue formed during pyrolysis of an oil when tested according to the specified methods [*see* IS : 1448 [P : 8] 1967*].

2.28 Char — Particles of partially burnt wick and fuel left after combustion.

2.29 Char Value — The amount of char obtained in a standard burning test for oil in a wick-fed lamp [*see* IS : 1448 [P : 5] 1970†].

2.30 Chimney — A structure or conduit enclosing a flue or flues connected to outside air for discharge of combustion products.

2.31 Combustion — A complex chemical reaction in which the substance combines with oxygen producing heat, light and flame.

2.32 Combustion Air — The air used for combustion of oil in an appliance:

a) *Primary Combustion Air* — The air introduced into fuel vapours or into burner before it ignites.

b) *Secondary Combustion Air* — The air admitted to the combustion zone after combustion with primary air has commenced.

2.33 Combustion Characteristics — The properties of a fuel (oil) which influence the behaviour of flame when fuel is burnt.

2.34 Combustion Efficiency — The degree of completeness of combustion as determined by the ratio of carbon monoxide to carbon dioxide (CO/CO₂) in combustion products.

2.35 Combustion Products — The constituents resulting from the combustion of a fuel with air or oxygen.

2.36 Cone — The part without perforations surrounding the burners, such as long-drum burner burning kerosene.

2.37 Congealing Point — The temperature at which the molten wax changes to solid state on cooling under specified conditions.

2.38 Consumption Rate — The full rated capacity of the appliance for burning oil expressed in g/h or l/h.

2.39 Cotton Wick — Suitable flat or round shaped uniformly smoothed wicks of cotton fabric through which fuel rises for burning (*see* IS : 1740-1977‡).

*Methods of petroleum and its products : [P : 8] Carbon residue by Ramsbottom method (*first revision*).

†Methods of test for petroleum and its products : [P : 5] Burning quality (*first revision*).

‡Specification for flat cotton wicks (*first revision*).

D

2.40 Damper — A device used to vary the volume of air passing through a confined cross-section by varying the effective sectional area.

2.41 Daylight Mantle — A light mantle so treated as to give a higher proportion of light of the shorter wavelengths than that from ordinary mantle.

2.42 Density — The mass per unit volume at a particular temperature.

2.43 Distillation Characteristics — The percent distillate at various temperatures and initial and final boiling points, etc, obtained on distillation of oil under specified conditions [*see* IS : 1448 [P : 18] 1967*].

2.44 Distillation Range — The temperature range which characterizes an oil fraction by its initial and final boiling points.

2.45 Draught — A pressure below atmospheric at the base of a chimney or in a waste gas flue.

2.46 Drip — The molten or fluid wax trickling down along the length of a wax candle while it burns.

2.47 Dynamic Viscosity — *See* absolute dynamic viscosity.

E

2.48 Eccentric — The part of the pressure lantern operating the cleaning needle for pricking of the nipple.

2.49 End Point — *See* final boiling point.

2.50 Excess Air — Air in excess of theoretical (stoichiometric) requirement for combustion of fuel.

2.51 Exhaust Gas — Generally the burnt flue gas coming out of a chimney.

F

2.52 Faucet — A device with a valve for regulating the flow of liquid from a pipe.

2.53 Final Boiling Point (End Point) — Maximum temperature noted during the distillation test carried out as per standard method [*see* IS : 1448 [P : 18] 1967*].

*Methods of test for petroleum and its product : [P : 18] Distillation (*first revision*).

2.54 Fire Guard — A device capable of preventing or minimizing the risk of fire resulting from an accidental proximity to flames or radiants in a heating appliance.

2.55 Fire Point — The lowest temperature at which the petroleum oil catches fire and burns continuously when a small flame is applied to its surface under prescribed conditions [see IS : 1448 [P : 66] 1969*].

2.56 Flame Creep — Increase in flame size while burner is operating, without adjustment being made to the control(s).

2.57 Flame Flicker — Rapid increase and decrease in the size of the flame.

2.58 Flame Height — See smoke point.

2.59 Flame Lift — Separation of a flame from burner head whilst continuing to burn with its base at some distance from the burner head.

2.60 Flame Ring — A conical ring used in pressure stove burner for radial and co-axial spread of flame.

2.61 Flame Spreader — Usually a flame ring or perforated cover used to spread the flame of the appliance.

2.62 Flame Stability — Absence of flicker and smoke in the flame of the appliance when tested by standard method.

2.63 Flash Back (Light-Back) — Transfer of flame from the burner into the mixing tube/mixing chamber fuel container of the appliance.

2.64 Flash Point — The lowest temperature at which the vapours emitted by an oil ignite momentarily in the presence of an external flame under specified conditions [see IS : 1448 [P : 20] 1982†; and IS : 1448 [P : 21]-1970‡].

2.65 Flue — A passage or port for conveying products of combustion outside in the air.

2.66 Flue Gas — The products of combustion including unused combustion air.

2.67 Flue Losses — The sensible heat of the flue gases and latent heat of water vapour leaving the appliance above ambient temperature.

*Methods of test for petroleum and its products: [P : 66] Flash point (open) and fire point by Pensky-Martens apparatus.

†Methods of test for petroleum and its products: [P : 20] Determination of flash point by Abel apparatus (first revision).

‡Methods of test for petroleum and its products: [P : 21] Flash point (closed) by Pensky-Martens apparatus (first revision).

2.68 Flued Appliance — An appliance designed for connection to a flue for venting the products of combustion outside the room in which the appliance is situated.

2.69 Flueless Appliance — An appliance designed for use without connection to a flue system, the products of combustion being allowed to mix with air of the room or space in which the appliance is located.

2.70 Forced Convection Heater — A space heater designed to heat the space by forced circulation of warmed air.

2.71 Fuel Bowl — An open trough in gravity-fed wick stove over which the oil container is kept reversed such that suitable level of oil is maintained in the bowl for flow to the wicks through the fuel feed pipe.

2.72 Fuel Creep — Spreading of fuel over any part of the appliance, including the burner, when operated under normal conditions of burning or when not in use.

2.73 Fuel Feed Pipe — The pipe connecting the fuel container to the burner in pressure stove or bowl to the burner in gravity wick stoves.

2.74 Fuel Level Indicator — A suitable float device located in the fuel container of the stove through which the level of oil is indicated outside.

G

2.75 Gallery — The part of the long drum burner having perforation which surrounds the burner.

2.76 Gas Mantle — A chemically treated art-silk netted mantle which is heated to incandescence and is used in oil pressure lanterns to give light of high candle power.

2.77 Gasket — A pie of ring of a suitable material like rubber, asbestos, metal, etc, placed around a joint to make it leak proof.

2.78 Gasoline — Petroleum distillate, generally boiling around the range 30 to 215°C, which is also termed in general use as petrol, motor spirit and motor gasoline.

2.79 Glass Globe — The glass chimney of the lantern surrounding the burner.

2.80 Globe-Base — A plate or such other device on which the glass globe of the lantern rests.

2.81 Globe-Holder — Suitable wire guards or such other device to hold the globe of the lantern firmly.

2.82 Globe-Lifting Mechanism — A device such as a formed wire lift with integral lever and a lever guide which locks the lever at the gap and bottom of the lift positions which when pressed will lift and lower the globe base along with globe without fouling against the burner dome of a lantern.

2.83 Gravity-Fed Stove — A non-pressure wick stove in which the oil reaches the burner by means of gravity head.

2.84 Guard — See fire guard.

H

2.85 Heat of Combustion — See calorific value.

2.86 Heavy Ends — The portion of an oil fraction being distilled which is of appreciably higher boiling point than the rest of the product.

2.87 Hood for Burner — The bowl shape enclosure used for collecting flue gas of an appliance for testing the combustion efficiency.

2.88 Hood of the Lantern — The upper part of the lantern resting over the glass.

2.89 Hot Plate — A solid plate located above the burner of the stove on which the vessels rest.

2.90 Hurricane Lantern — A storm-proof wick-fed lantern burning kerosene at atmospheric pressure and primarily intended for outdoor use.

I

2.91 Ignition Temperature — The minimum temperature of the oil at which it will burn spontaneously without the help of external source of flame when tested under specified conditions.

2.92 Illuminating Oil — The oil suitable for use in wick-fed or mantle type lamps. The term is generally used for kerosene, long time burning oil, mineral colza, mineral seal and signal oil.

2.93 Initial Boiling Point — The temperature at the moment when the first drop of condensate falls from the tip of the condenser during standard distillation test [see IS : 1448 [P : 18] 1967*].

2.94 Interchangeability — The suitability of burners, wicks, kindlers and other catalogued parts of the same model and capacity to interchange without adverse effect upon performance.

*Methods of test for petroleum and its products : [P : 18] Distillation (*first revision*).

K

2.95 Kerosene — A petroleum distillate in distillation range of 150-300°C and of intermediate volatility between gasoline and gas oil which is mainly used for lighting and heating.

2.96 Kindler — A thick cotton or asbestos fabric covered with removable wire-gauze or interwoven with metallic fibre used for lighting wicks of the stove.

2.97 Kindler Burner — A type of burner in which the fuel feeding device consists of a trough in which there is a kindler for lighting purposes.

2.98 Knob — A gripping component attached to a control (like fuel tap) for manually rotating it.

L

2.99 Lantern Arms — The hollow side tubes which form air/flue gas passages between the hood and the base of the burner support.

2.100 Life — The number of hours to which a gas mantle lasts when tested for life-test at standard conditions (see IS : 2788 - 1981*).

2.101 Light Distillate — A distillate generally with a final boiling point not exceeding 300°C.

2.102 Light-Ends — The portion of an oil fraction being distilled which is of appreciably lower boiling point than the rest of the product.

2.103 Lighting Efficiency — The ratio of the mean horizontal luminous intensity in candelas to the weight in grams of fuel consumed per hour in a lighting appliance.

2.104 Lint — A mixture of dust, fluff, fibres and droplets of oil or grease which can collect in the passage of burner.

2.105 Long Drum Burner — The burners having a flue or chimney to induce air for combustion which are of the following types:

- a) *Blue Flame Type* — The burner in which the air for combustion is introduced in such a way as to maintain a blue flame.
- b) *Yellow Flame Type* — The burner in which the air for combustion is introduced in such a way as to produce a luminous flame.

2.106 Long-Time Burning Oil — The kerosene suitable for continuous burning in wick-fed lamps, specially railway signal lamps for prolonged periods without attention.

*Specification for gas mantles (*first revision*).

2.107 Lumen — Unit of luminous flux equal to that emitted in a unit solid angle by a point source of one candela.

2.108 Luminous Intensity — *See* candle power.

2.109 Lux — Unit of illumination equal to one lumen per square metre or the illumination of a surface uniformly one metre distance from a point source of one candela.

2.110 Luxmeter — The equipment forming the part of photometric assembly used for measurement of mean horizontal luminous intensity (MHLI) of lighting appliance.

M

2.111 Mantle — *See* gas mantle.

2.112 Mantle Holder — Usually a fireclay support to which an inverted mantle is attached.

2.113 Mean Horizontal Candle Power — The average of all the luminous intensities in candelas measured in a horizontal plane passing through the centre of the luminous mantle.

2.114 Mean Horizontal Luminous Intensity — *See* mean horizontal candle power. $MHLI (Cd) = Lux \times (Distance \text{ in metres})^2$.

2.115 Mineral Colza; Mineral Seal; Mineral Sperm — Highly refined petroleum distillate, normally boiling within the limits 250 to 350°C, used as burning oil when a high flash point (above 120°C) is required.

2.116 Mineral Seal — *See* mineral colza.

2.117 Mineral Sperm — *See* mineral colza.

N

2.118 Natural Draught — The air supply induced naturally due to lowering of pressure caused by the warming of air in a chimney.

2.119 Nipple — A threaded piece of tube fitted to oil pressure burner, to which a nozzle is fastened.

O

2.120 Offset-Burner Type Stove — The stove in which the burner is not directly attached to fuel container but connected through a fuel feed pipe and the fuel container is located with an offset to the burner axis.

2.121 Oil — Unless otherwise mentioned, the term oil will mean kerosene oil of specification given in IS : 1459 - 1974*.

2.122 Oil Filler Cap — The opening located on a fuel container for filling fuel into it.

2.123 Olefins — Chemically-reactive unsaturated hydrocarbons of open-chain (aliphatic) structure produced during the cracking of petroleum.

2.124 Orifice — The opening in an orifice-cap, orifice-spud or other device whereby the flow of gas is limited and through which the oil is discharged.

P

2.125 Pan Support — A framework of the appliance on which the cooking vessels rest.

2.126 Paraffins — Saturated hydrocarbons of open-chain (aliphatic) structure.

2.127 Paraffin Oil — *See* kerosene.

2.128 Paraffin Wax — A mixture of saturated hydrocarbons obtainable from petroleum, solid at normal temperatures, and having relatively pronounced crystalline structure.

2.129 Perforated Sleeves — The hollow cylindrical conical shaped structures made of perforated sheet which serve as part of the burners of the wick stove. The wick (s) are located in the annular space between the inner and outer sleeve.

2.130 Petrol — *See* gasoline.

2.131 Petroleum Wax — *See* paraffin wax.

2.132 Photometer — A standard equipment assembly incorporating a luxmeter used for measurement of mean horizontal luminous intensity (MHLI) of a lighting appliance.

2.133 Pickling — A specific treatment of candle-wicks in a given solution for imparting to the wicks, a desired property.

2.134 Poking Rod — A rod having a sliding fit in the upper part of the vaporizer of pressure lantern. The rod is used to actuate the clearing needle into the nipple.

2.135 Portable Appliance — An appliance designed to be carried by the users from place to place, as required.

*Specification for kerosenes (*second revision*).

2.136 Pressure (Vaporizing Type) Burner — A burner assembly consisting of a burner head with a cavity in which the kerosene is vaporized by the heat of the flame or by a separate heat supply during pre-heating. The vapour emerges from a nipple or injector in such a manner that the kinetic energy is utilized to entrain and mix the primary combustion air with the vapour.

2.137 Pressure Release Valve — The opening screw fitted in the oil container of the appliance to release the container pressure quickly and safely.

2.138 Pricker — This needle shaped pin usually at one end of a strip is fitted in a perpendicular holder, used to prick or to clean the nipple of the pressure burner.

2.139 Primary Combustion Air — See combustion air.

R

2.140 Radiants — The heating elements of a radiant heater.

2.141 Radiant Heater — An appliance designed for space heating mainly by emission of radiant heat

2.142 Rating — The normal rate of consumption of oil by the appliance in litres/hour (see consumption rate).

2.143 Reid Vapour Pressure — Vapour pressure of volatile products as determined by a standard method of test [see IS : 1448 [P : 39] 1967*].

2.144 Relative Density — See specific gravity.

S

2.145 Safety Pressure — The internal hydraulic pressure inside the fuel container of the appliance which the container will withstand for specified time without leakage or appreciable deformation.

2.146 Saturated Hydrocarbons — Hydrocarbons which do not form direct addition compounds as the valency of carbon atom is saturated (example : paraffins).

2.147 Scale Wax — A paraffin wax, incompletely de-oiled.

2.148 Secondary Air — See secondary combustion air [2.32(b)].

2.149 Self-Extinguishing Device — A mechanism or any other feature incorporated in the design of particularly a space heater or cooker to

*Methods of test for petroleum and its products: [P : 39] Vapour pressure by Reid method (first revision).

ensure the extinguishing of flame, should the lighted appliance be overturned.

2.150 Shoe — The cup like rubber fillet for protecting the leg of an appliance.

2.151 Short Drum Burner — A burner consisting mainly of one or more pairs of perforated sleeves or plates mounted above a fuel feeding device. Kerosene vapours are burnt in the space between the sleeves and partly above them, producing a non-luminous blue flame. The long drum that forms an essential feature of long drum burners is not required in this type.

2.152 Signal Oil — *See* long-time burning oil.

2.153 Slack Wax — Crude paraffin wax containing a high proportion of oil and obtained by filtering a wax distillate.

2.154 Smokes Funnel — The crown of the hurricane lantern having slit openings for escape of smoke.

2.155 Smoke Point — Maximum flame height in millimetres at which kerosene will burn in a wick-fed lamp without smoke under prescribed conditions [*see* IS : 1448 [P : 31] 1968*].

2.156 Smoulder — To burn slowly without smoke and flame.

2.157 Soot — Unburnt particles of carbon or carbonaceous substances present in flue gas.

2.158 Space Heating — The heating of one or more rooms or other spaces to produce a desired temperature therein.

2.159 Specific Gravity (Relative Density) — The ratio of the mass of unit volume of oil to that of unit volume of distilled water at 15.5°C temperature.

2.160 Stability — The ability of the appliance not to overturn either when empty or filled with fuel on being tilted to a specified angle in any direction.

2.161 Stoichiometric Air — *See* theoretical air requirement.

2.162 Stove — An assembly of one or more burners forming a separate unit with fuel container, allowing direct contact between the flames or hot gases from the burner(s) and the vessel above them.

*Methods of test for petroleum and its products; [P : 31] Smoke point (*first revision*).

T

2.163 Test Pan — A standard cylindrical flat bottom aluminium vessel with lid whose capacity varies with the capacity of stoves which is used in determination of thermal efficiency.

2.164 Theoretical Air Requirement — The quantity of air required for complete combustion of unit weight of oil (also called stoichiometric air), as calculated from composition of combustible contents of fuel.

2.165 Thermal Efficiency — The ratio of heat entering into the vessel and its contents to the heat theoretically produced by complete combustion of a particular quantity of fuel (which is based on net calorific value of the fuels) which has been consumed in that time in a stove.

U

2.166 Unflued Appliance — *See* flueless appliance.

2.167 Unsaturated Hydrocarbons — Hydrocarbons in which the valency of carbon atom is not fully satisfied and hence these form direct addition compound directly.

V

2.168 Valve — A device used to stop or regulate the flow of fluid by full or partial closure of cross-sectional area of flow.

2.169 Vaporizer — The L-shaped or straight tube assembly in the pressure lantern in which the fuel vapour is thrown centrally inside the mixing tube.

2.170 Vapour Pressure — The pressure created by the vapour of a liquid in an enclosed space above the level of the liquid (*see also* Reid vapour pressure).

2.171 Viscosity — *See* absolute dynamic kinematic viscosity.

W

2.172 Warm-Up Time — The time measured from applying a lighter flame to obtaining full stable flame in a given appliance.

2.173 Wax — *see* paraffin wax.

2.174 Wick Carrier/Winder — A mechanism in a wick-fed appliance enabling to give an even adjustment of the wick.

2.175 Wick-Fed Stove — A non-pressure stove in which a single wick or a number of wicks are used to lift the fuel from fuel container to the burner.

2.176 Wick Stop — A device to stop the upper movement of wick in a wick-fed appliance beyond a certain height so as to prevent the flame from reaching smoking conditions.

2.177 Wick-Through — A circular space around the bottom of perforated sleeves of wick stove in which the wick is housed and gets soaked with oil collected in it.

Y

2.178 Yellow Tipping — The appearance of a yellow colour at the top periphery of the flame in an appliance.